REMARKS

Claims 1-16 are pending. By this Amendment, the specification is amended and claims 1, 2, 9, 10 and 12 are amended. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Claims 1-16 were rejected under 35 U.S.C. §103(a) over Singer et al. (U.S. Patent Application Publication 2003/0043455 A1, hereinafter Singer et al. '455) in view of Singer et al. (U.S. Patent Application Publication 2004/0065817 A1, hereinafter Singer et al. '817) and Glavish et al. (U.S. Patent 4,916,322). The rejection is respectfully traversed.

Applicants respectfully note that Singer et al. '455 is not of record in the instant application as it was neither submitted by Applicants and listed on a PTO-1449 nor cited by the Examiner and listed on the PTO-892. Applicants respectfully request that Singer et al. '455 be made of record in the next Office Action.

MPEP §707.07(d) states: "A plurality of claims should never be grouped together in a common rejection, unless that rejection is equally applicable to all claims in the group."

Applicants respectfully note that Singer et al. '455, Singer et al. '817 and Glavish et al. have been applied equally against each of claims 1-16. For example, Singer et al. '817 has been relied on by the Examiner for its alleged disclosure of cooling plates laid on the mirror shells so that heat is removed by radiation. Claims 8 and 12 recite that the outer reflector comprises radiation fins. However, Singer et al. has been applied to claims 1-7, 9-11 and 13-16, even though none of those claims recite radiation fins or cooling plates. As another example, Glavish et al. have been relied on by the Examiner for allegedly disclosing that carbon has an emissivity 0.6. Claims 2, 3, 10 and 16 recite a specified emissivity and material for the reflectors. However, Glavish et al. have been applied also against claims 1, 4-9 and 11-15.

The Examiner is respectfully requested to clarify the applicability of each of the three references against each of the claims individually, as opposed to grouping the three references in a common rejection as specifically prohibited by MPEP §707.07(d).

MPEP §2143 states: "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a

reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations."

The combination of Singer et al. '455, Singer et al. '817 and Glavish et al. fails to present a *prima facie* case of obviousness against each of claims 1-16 because: (1) the combination fails to include all the limitations of each of claims 1-16; and (2) there is no motivation or suggestion, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to combine the reference teachings in the manner alleged by the Office Action.

Claim 1 recites a lithographic projection apparatus including, *inter alia*, a reflector assembly placed in the vicinity of a source or an image of the source including an inner and an outer reflector extending in the direction of an optical axis on which the source or the image is located. The inner reflector is closer to the optical axis than the outer reflector. The inner and outer reflectors each have an inner reflector surface and an outer backing layer, the inner reflective surface of the outer reflector facing the backing layer of the inner reflector. The backing layer of the inner reflector is covered with a reflective layer having a reflectivity of between 0.7 and 0.99 for wavelengths between 0.1 and 100 μm.

The Office Action on page 2, paragraph number 2 alleges that Singer et al. '455 disclose a mirror shell reflector assembly 180 including a plurality of mirror shells and that the reflectors are coated with a noble metal and under grazing incidence, the reflectivity is greater than 70%. The Office Action alleges that this feature is shown in paragraph [0035] of Singer et al. '455.

Applicants respectfully note that reference number 180 of Singer et al. '455 denotes a diaphragm, not a mirror shell reflector assembly as alleged in the Office Action.

Singer et al. '455 disclose in paragraph [0035] that Wolter systems having a maximum collection aperture of approximately .98 can be selected with two reflections with incidence angles smaller than 20° relative to the surface tangent. In such a case one is still in the high-reflecting region of the reflection under grazing incidence with a reflectivity greater than 70%.

Figures 15-17 of Singer et al. '455 disclose various embodiments of nested Wolter type collectors. As shown in Figures 15-17, and as disclosed in paragraphs [0149-0160], a Wolter type collector includes a plurality of nested reflectors or mirrors shells. For example, the collector shown in Figures 15 includes three mirror shells 200, 202, and 204. The

collector shown in Figure 16 includes two mirror shells 200 and 202 and the collector shown in Figure 17 includes eight mirror shells 200, 202, 204 and 205-209. Each reflector or mirror shell includes a first segment and a second segment wherein the first and second segments are at different angles so as to provide two reflections of the radiation within the collector. As discussed above, paragraph [0035] of Singer et al. '455 discloses that the use of a Wolter system to provide two reflections to provide a maximum collection aperture.

There is no disclosure or suggestion by Singer et al. '455 of a reflector assembly including an inner and an outer reflector, wherein a backing layer of the inner reflector is covered with a reflective layer having a reflectivity of between 0.7 and 0.99 for wavelengths between 0.1 and 100 μm, as recited in claim 1. As discussed above, as shown in Figures 15-17 of Singer et al. '455, the Wolter type collectors include inner and outer reflectors. However, there is no disclosure or suggestion of the reflector elements or mirror shells of the Wolter type collectors include a backing layer on the inner reflector element or mirror shell that is covered with a reflective layer having a reflectivity between 0.7 and 0.99 for wavelengths between 0.1 and 100 μm.

It is respectfully submitted that Singer et al. '817 and Glavish et al. fail to cure the deficiencies of Singer et al. '455 with respect to claim 1 and that even assuming it would have been obvious to combine all three references, the combination would not include all the limitations of claim 1 and would fail to present a *prima facie* case of obviousness. As discussed above, Applicants respectfully request the Examiner to clarify the applicability of Singer et al. '817 and Glavish et al. to claim 1.

Claim 2 recites a lithographic projection apparatus including a reflector assembly including an inner and outer reflector. The inner and outer reflectors each have an inner reflective surface and an outer backing layer. The inner reflective surface of the outer reflector faces the backing layer of the inner reflector. The backing layer of the outer reflector is covered with a radiative layer having an emissivity of between 0.6 and 0.9 for wavelengths between 0.9 and 100 μm.

The Office Action acknowledges that Singer et al. '455 does not disclose or suggest an outer reflector having a backing layer covered with a radiative layer having an emissivity of between 0.6 and 0.95 for wavelengths between 0.1 and 100 μm. The Examiner relies on

Glavish et al. for allegedly teaching this feature. However, Glavish et al. do not teach this feature.

Glavish et al. disclose an arrangement for stabilizing an irradiated mask including one or more cooling surfaces that surround the axis of a beam and are located between the mask and the source. Glavish et al. disclose in column 9, lines 4-8, that silicon surfaces have an emissivity equal to 0.6 and for this reason metal masks are desirably coated with a material such as graphite. Glavish et al., however, do not disclose or suggest a reflector assembly including an outer reflector having a backing layer covered with irradiated layer having an emissivity of between 0.6 and 0.95 for wavelengths between 0.1 and 100 μm.

As neither Singer et al. '455, Singer et al. '817 nor Glavish et al. disclose or suggest a reflector assembly having an outer reflector with a backing layer including the emissivity as recited in claim 2, the combination fails to include all the limitations of claim 2 and fails to present a *prima facie* case of obviousness against claim 2.

Applicants again respectfully request that the Examiner clarify the applicability of Singer et al. '817 to claim 2.

It is also respectfully submitted that there is no suggestion or motivation to combine Singer et al. '455, Singer et al. '817 and Glavish et al. Glavish et al. disclose a system for stabilizing an irradiated mask. Glavish et al. do not disclose or suggest to one of ordinary skill in the art anything about reflector assemblies used to collect radiation from a source to provide a beam of radiation for a lithographic apparatus or process. It appears to be the position of the Examiner that because Glavish et al. disclose stabilizing an irradiated mask, that it would have been obvious to apply the mask coating of Glavish et al. to a reflector assembly or collector, such as disclosed by Singer et al. '455 or '817. Glavish et al. disclose nothing about collectors or reflector assemblies and the determination that it would have been obvious to one of ordinary skill to apply Glavish et al.'s teachings regarding masks to collectors or reflector assemblies is nothing more than an impermissible hindsight reconstruction of the claimed invention.

Claims 3-8 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claims 1 and 2 for the additional features recited therein.

Claim 9 recites a reflector assembly including an inner and outer reflector. The inner and outer reflectors each have an inner reflective surface and an outer backing layer. The

inner reflective surface of the outer reflector faces the backing layer of the inner reflector. The backing layer of the inner reflector is covered with a reflective layer having a reflectivity of between 0.7 and 0.99 for wavelengths between 0.1 and 100 μm,

As discussed above with respect to claim 1, Singer et al. 455 disclose Wolter type collectors that include nested reflector elements or mirror shells that provide two reflections of the radiation from the source. The reflector elements or mirror shells may be coated with various metals and have a reflection under gazing incidence of greater than 70%. However, as discussed above, there is no disclosure or suggestion by Singer et al. '455 of backing layer of an inner reflector element or mirror shell being covered with a reflective layer having a reflectivity as recited in claim 9. As also discussed above, neither Singer et al. '817 nor Glavish et al. cure this deficiency of Singer et al. '455. Applicants again respectfully request that the Examiner clarify the applicability of Singer et al. '817 and Glavish et al. to claim 9.

As neither Singer et al. '455, Singer et al. '817 nor Glavish et al. disclose or suggest a reflector assembly having an inner reflector with a backing layer being covered with a reflective layer as recited in claim 9, the combination fails to include all the limitations of claim 9 and fails to present a *prima facie* case of obviousness.

Claim 10 recites a reflector assembly including an inner and outer reflector. A backing layer of the outer reflector is covered with a radiative layer having a emissivity of between 0.7 and 0.99 for wavelengths between 0.1 and 100 μm.

As discussed above, there is no disclosure or suggestion by Singer et al. '455, Singer et al. '817 or Glavish et al. of a backing layer of an outer reflector of a reflector assembly being covered with a radiative layer having an emissivity of between 0.7 and 0.99 for wavelengths between 0.1 and 100 μm. Accordingly, the combination fails to include all the limitations of claim 10 and fails to present a *prima facie* case of obviousness.

Claims 11-16 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claims 9 and 10 and for the additional features recited therein.

Reconsideration and withdrawal of the rejection of claims 1-16 over Singer et al. '455 in view of Singer et al. '817 and Glavish et al. are respectfully requested.

In view of the above amendments and remarks, Applicants respectfully submit that all the claims are allowable and that the entire application is in condition for allowance

Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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